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Analysis of the demographic bonus influence on Gross Regional Domestic Product (GRDP)

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ABSTRACT

This study aims to determine the influence of demographic bonus on GRDP in North Sumatra Province. Secondary data sourced from Central Bureau of Statistics *(BPS)* regarding the Demographic Bonus consisting of HDI, Dependency Ratio, Labor Force Participation Rate, and GRDP were used. The data included a panel of 33 districts/cities in North Sumatra for three years from 2020 to 2022. The analytical approach used in this study was Fixed Effect regression analysis. The findings reveal that HDI has a statistically significant and positive influence on GDP in North Sumatra. In contrast, the Dependency Ratio shows a statistically insignificant and negative impact on GRDP, while TPAK shows a statistically insignificant and positive impact on GRDP in North Sumatra.

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1. INTRODUCTION

Economic development is a development that involves increasing per capita income and total income, considering population growth along with major transformations in a country's economic structure, and trying to achieve equal distribution of income among all its residents (Hernovianty, 2021; Syofya, 2017). Economic development is closely related to Economic Growth, where it can facilitate and stimulate the latter, and vice versa, economic growth plays a role in advancing the economic development process (Bkpm.go.id, 2022; Purwati & Prasetyanto, 2022).

Population is a significant asset for a region during the development process (Ministry of Health of the Republic of Indonesia, 2018). A region will be more likely to undergo a successful development process if it has high-quality residents (Seibert et al., 2018; Whitten et al., 2020; Zofkie et al., 2022). On the other hand, if the quality of the population is low, this can be a burden for the area, leading to increased levels of unemployment and poverty, especially in areas with large populations (Huda et al., 2021).

In 2022, the GRDP in North Sumatra per district/city will fluctuate. However, it can be seen from the graph above that the highest GRDP of Langkat Regency in North Sumatra was10,46%, and the lowest in South Nias was 5,83%. In 2020, the GRDP of South Nias was low, this was due to the Covid-19 case that spreading in that year, but over time, the GRDP of South Nias began to increase.

The changing demographic composition of the population has the potential, under certain conditions, to be a significant driver of economic progress and family well-being (Li, 2022; Tarsi & Tuff, 2012; Werner et al., 2022). The favorable situation has existed for a long time, but opportunities will begin to close after the next ten years (Index & Nasution, 2021). This research

was conducted to determine the influence of the demographic bonus on GRDP in North Sumatra Province. Demographic bonuses here include HDI (Human Development Index), Dependency Ratio, and LFPR (Labor Force Participation Rate). The theoretical implications of this research can add to scientific studies regarding Gross Regional Domestic Product (GRDP). The practical implication of this research is that it can provide advice for regional policy developers.

2. RESEARCH METHOD

Research Model

There are three methods used to estimate panel regression models, including Common Effect, Fixed Effect, and Random Effect (Sugiyono, 2019; Yusup, 2018). Determining the most suitable estimate, whether it is CEM, FEM, or REM, was determined through preliminary testing by applying the Chow Test and Hausman Test to ensure optimal results.

Chow Test

This test was carried out to compare and choose between CEM or FEM models in analysis. Decisions were taken based on the prob (p) value from the Cross-Section F test. If the p value is greater than 5%, then CEM is selected as the best estimate. However, if the p value is less than 5%, then the FEM model is selected as a more appropriate model.

Hausman Test

The Hausman Test was used to compare and select related FEM models to REM models. Decisions were taken based on the probability (p) value from the Random Cross-Section test. If the p value is greater than 5%, then the REM model was selected as a better model. However, if the p value is less than 5%, then FEM is selected as a suitable estimate.

LM Test

This test was carried out to determine whether REM was better than CEM. This test was also used to confirm the inconsistent FEM and REM model results in previous tests.

3. RESULTS AND DISCUSSIONS

Tabel 1. Test Chow

Effect Test	Statistics	df	Prob
Cross-section F	3.071036	(32.63)	0.0001.
Chi square cross-section	93.056505	32	0.0000.

F and Chi Square prob values are smaller than the Alpha level of 5%. Therefore, the best model to use is Fixed Effect. The Chow test results rejected the CEM test, so the data test continued to the Hausman test.

Table 2. Hausman test

Test Summary	Chi-Sq Statistics.	Chi-Sq df	Prob
Random cross-section	50.169152	3	0.0000

In the test above, the probability value (p) is for the Random Cross Section. If the p value is greater than the 5% alpha level, the REM model was selected. However, Prob < 5% FEM is selected.

Table 3. Multicollinearity Test

	TPAK	DEPENDENCE RATIO	HDI
TPAK	1,000000	0.573259	-0.258887
DEPENDENCE RATIO	0.573259	1,000000	-0.499300
HDI	-0.258887	-0.499300	1,000000

Based on testing multicollinearity above, the VIF value of the three variables is <0.85. It can be concluded that it is free from multicollinearity testing.

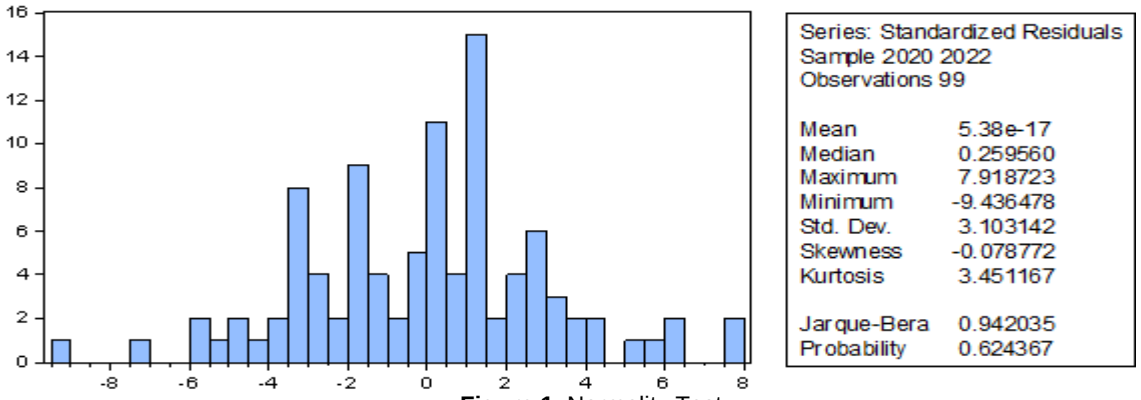

Figure 1. Normality Test

It can be seen from the normality test above that the result is that the prob. 0.624 < 0.05. Thus, the regression model in this study has a normal distribution.

Table 4. FEM model

Variables.	Coefficient	Std. Error	t-Statistics	Prob
C	-387.5241	64.06038	-6.049358	0.0000
TPAK	0.056960	0.092833	0.613571	0.5417
DEPENDENCE RATIO	-45.64655	34.93449	-1.306633	0.1961
HDI	5.794703	0.896372	6.464620	0.0000
R-squared.		0.610084		
Adjusted R-Squared		0.393464		
F-statistic		2.816381		
Prob(F-statistic)		0.000171		

Based on the research table, it can be described as follows:
Yit = β0 + β1TPTit + β2PDRBit + β3IPMit + β4KPMt + eit
Y = -387.5241+ 0.056960–45.64655+5.794703eit
Where:
β0 = Constant
β1TPAK = Regression Coefficient of Labor Force Participation Level
β2DEPENDENCE RATIO = Regression Coefficient DEPENDENCE RATIO
β3IPM = HDI Regression Coefficient
e = error
i = Cross-section of districts /cities in North Sumatra Province
t = Time Series (2020-2022)

Partial Significance Test

a. Partially, TPAK has a positive influence on GRDP in North Sumatra. However, the probability value obtained is 0.5417 > 5%, indicating that this effect is not statistically significant on GRDP in North Sumatra.
b. Partially, the Dependency Ratio has a negative influence on GRDP in North Sumatra. The probability figure obtained is 0.1961 > 5%, which indicates that this effect is not statistically significant on GRDP in North Sumatra.
c. Partially, HDI has a positive influence on GRDP in North Sumatra Province. In addition, the probability obtained is 0.0000 < 5%, indicating that this influence is statistically significant on GRDP in North Sumatra.

Simultaneous Significance Test

TPAK, DEPENDENCE RATIO, and HDI have a significant influence on GRDP in North Sumatra with the value of Prob. (F-Statistic) of 0.000 < 5%.

Test (R2)

Based on the R-Square value in the table above, it shows 0.610084. It can be interpreted that the variables of TPAK, DEPENDENCE RATIO, and HDI can explain 61% of GRDP in North Sumatra, and the rest is explained by variables not included in this research model.

Influence of Dependency Ratio on GRDP

The results of testing the Dependency Ratio variable show that the Dependency Ratio has a negative influence on GRDP in North Sumatra and is not significant. This finding is not in line with the findings of Purwati & Prasetyanto (2022) who found that the dependency ratio has a significant and positive influence on economic growth. However, research conducted by Huda et al. (2021) and Hermawan's (2019) findings that the Dependency Ratio variable has a negative influence on economic growth. Low income can increase health and sanitation problems, difficulties in meeting their daily needs, and the welfare of the non-productive age population must be borne by young people. A high birth rate causes the burden to be borne by the productive age population to become greater. Limited employment opportunities have triggered the problem of unemployment, causing many people of productive age to be unable to bear the burden of living for people of productive and non-productive age (Bodkin et al., 1999; Kanasi et al., 2016; Zofkie et al., 2022).

The Influence of HDI on GRDP

The results of testing the HDI variable show that HDI has a positive influence on GRDP in North Sumatra and is significant. This finding is in line with the findings of Asmoro et al. (2022); Farah Diffa Hanum et al. (2022) found that HDI has a significant effect on economic growth. This shows that increasingly superior human resources (HR) will provide benefits for the government both in economic, social aspects and of course human resources themselves. The higher the productivity of a society, the easier it will be for human resources to be absorbed in various sectors, especially the economic sector. When HDI increases, economic growth also increases. HDI is indicated by several factors, such as education, health care, and per capita income. This idea is supported by Solow Swan's neoclassical growth theory, which states that economic growth is influenced by capital accumulation. In simple terms, economic growth tends to increase when there is more capital available, and tends to decrease when there is a scarcity of capital. The higher the productivity of a society, the easier it will be for human resources to be absorbed in various sectors, especially in the economic sector.

The influence of TPAK on GRDP

The results of testing the TPAK variable show that TPAK has a positive and insignificant influence on GRDP in North Sumatra. The findings of Savira et al. (2020) mentioned that TPAK has an insignificant positive influence on and on Economic Growth. In contrast to the findings of Syamsuddin et al. (2021), TPAK had a positive and significant influence on economic growth in Aceh. These findings indicate that every increase in the Labor Force Participation Rate will be followed by an increase in economic growth.

4. CONCLUSION

According to the results of the research above, it can be concluded that TPAK has an insignificant and positive influence on GRDP, the Dependency Ratio has an insignificant and negative influence on GRDP, and the Human Development Index has a significant and positive influence on North Sumatra's GRDP.

REFERENCES

Asmoro, FAF, Hasmarini, MI, & Fakhruddin, H. (2022). Analysis of the Influence of the Human Development Index, Labor and Regional Original Income on Economic Growth in Karanganyar Regency 2008-2021. *Batanghari University Jambi Scientific Journal* , *22* (3), 1788. https://doi.org/10.33087/jiubj.v22i3.3023

Bkpm.go.id. (2022). Indonesia's Economic Growth in 2022 Returns to Normal. *Data.Tempo.Co*. https://data.tempo.co/data/1614/perbangun- Ekonomi-indonesia-2022-re-normal

Bodkin, J. L., Ballachey, B. E., Cronin, M. A., & Scribner, K. T. (1999). Population demographics and genetic diversity in remnant and translocated populations of sea otters. *Conservation Biology*, *13* (6). https://doi.org/10.1046/j.1523-1739.1999.98124.x

Farah Diffa Hanum, Sugianto, & Sri Murtatik. (2022). Determination of Economic Growth in West Java Province. *SIBATIK JOURNAL: Scientific Journal of Social, Economic, Cultural, Technological and Educational Sectors*, *1* (6), 941–950. https://doi.org/10.54443/sibatik.v1i6.111

Hermawan, I. (2019). Analysis of the Effect of the Demographic Bonus on Economic Growth. *Journal of Assets: Accounting and Finance Research* , *1* (2), 32–48. https://doi.org/10.52005/aktiva.v1i2.27

Hernovianty, FR (2021). The Role of Infrastructure Development in the Economic Growth of the Mempawah Regency Region. *UNIPLAN: Journal of Urban and Regional Planning*, *2* (1). https://doi.org/10.26418/uniplan.v2i1.45896

Huda, IU, Karsudjono, AJ, & Darmawan, R. (2021). The Influence of Content Marketing and Lifestyle on Purchasing Decisions in Small and Medium Enterprises on Social Media. *Al-KALAM JOURNAL OF COMMUNICATIONS, BUSINESS AND MANAGEMENT*, *8* (1), 32. https://doi.org/10.31602/al-kalam.v8i1.4156

Index, HD, & Nasution, M. (2021). *Relationship between Demographic Bonus, Human Development Index, and Development Index*. *6* (1), 74–95.

Kanasi, E., Ayilavarapu, S., & Jones, J. (2016). The aging population: demographics and the biology of aging. In *Periodontology 2000* (Vol. 72, Issue 1). https://doi.org/10.1111/prd.12126

Indonesian Ministry of Health. (2018). Indonesian Ministry of Health. Indonesia Health Profile 2017. Data and Information. Indonesian Ministry of Health; 2018. In *Journal of Health Sciences* .

Li, T. (2022). Exploring spatial variations of US rock music concerts in relation to population demographics and leisure and hospitality industry. *Annals of GIS*, *28* (3). https://doi.org/10.1080/19475683.2022.2031293

Purwati, WD, & Prasetyanto, PK (2022). ANALYSIS OF THE INFLUENCE OF DEMOGRAPHIC BONUS ON ECONOMIC GROWTH IN INDONESIA (Analysis of the Influence of Demographic Bonus on Economic Growth in Indonesia). *Economina Journal*, *1* (3).

Savira, F., Fatimah, S., Asli, P., & Modal, B. (2020). *The Influence of Pad, Capital Expenditures and Tpak on Gross Regional Domestic Product in Regencies/Cities of Ntb Province* . 77–99.

Seibert, K.L., Whitledge, G.W., Rude, N.P., Oliver, D.C., Loubere, A., & Seibert, J.R. (2018). Population demographics of sauger and simulated effects of minimum length limits in the Kaskaskia and Ohio rivers. *Journal of Fish and Wildlife Management* , *9* (2). https://doi.org/10.3996/092017-JFWM-079

Sugiyono. (2019). *Quantitative, Qualitative, and R&D Research Methods.*

Syamsuddin, N., Nelly, Rahmi, Hadi Saputra, D., Mulyono, S., Muhammad, Fuadi, Z., & Anwar. (2021). The Influence of Labor Force Participation Levels and Education on Economic Growth in Aceh Province. *Jurnal Sociohumaniora Kodepena (JSK)*, *2* (1), 29–49. https://doi.org/10.54423/jsk.v2i1.61

Syofya, H. (2017). Analysis of the Impact of International Trade on Economic Development Impact of International Trade on Economic Development. *Journal of Accounting & Economics*, *7 No 1* .

Tarsi, K., & Tuff, T. (2012). Introduction to population demographics. *Nature Education Knowledge*, *3* (11).

Werner, J.P., Dean, Q.J., Pegg, M.A., & Hamel, M.J. (2022). Spatial Variability of Silver Carp Population Demographics in a Large Tributary River. *North American Journal of Fisheries Management*, *42* (4). https://doi.org/10.1002/nafm.10777

Whitten, AL, DeBoer, JA, Solomon, LE, Fritts, AK, Fritts, MW, Pendleton, RM, VanMiddlesworth, TD, & Casper, AF (2020). Spatial variation in bluegill population demographics in a highly modified large river system. *Journal of Freshwater Ecology*, *35* (1). https://doi.org/10.1080/02705060.2020.1806122

Yusup, F. (2018). Validity and Reliability Test of Quantitative Research Instruments. *Tarbiyah Journal: Educational Scientific Journal*, *7* (1). https://doi.org/10.18592/tarbiyah.v7i1.2100

Zofkie, AC, Garner, WH, Schell, RC, Ragsdale, AS, McIntire, DD, Roberts, SW, & Spong, CY (2022). An evidence-based definition of anemia for singleton, uncomplicated pregnancies. *PLoS ONE*, *17* (January 1). https://doi.org/10.1371/journal.pone.0262436